



Desert Sky Observer

Volume 39

Antelope Valley Astronomy Club Newsletter

November 2019

Up-Coming Events

November 2: [Lunar club](#)

November 8: Club Meeting*

November 16: [Prime Desert Moon Walk](#)

November 23: Dark Sky Star Party

* Monthly meetings are held at the S.A.G.E. Planetarium in Palmdale, the second Friday of each month. The meeting location is at the northeast corner of Avenue R and 20th Street East. Meetings start at 7 p.m. and are open to the public. *Please note that food and drink are not allowed in the planetarium*

President

Darrell Bennett

October brought a great death to the astronomy world. I'm not talking about a person but an event, The Riverside Telescope Makers Conference (RTMC). After 51 years, it has finally ended. The current Board of the RTMC made the difficult decision to end it, saying it no longer was feasible to go on. In the last few years the attendance has dropped to the low 300's, where 10 to 15 years ago the attendance was over 1800 people and had to turn vendors away because they did not have room for them.

The first time I attended the RTMC was in 1983, the AV Club started going around 2002. Many of the members of the club have been going there for many years, and a lot of the times we would setup our own encampment with motorhomes, trailers and tents. A few times the club would set up an information booth about our club. The weather was mostly clear but we did have snow, rain and strong winds at times. The best part of RTMC was the Swap Meet that started on Saturday morning when the sun first came up. I always got a great deal on stuff. I will truly miss going there and hope something bigger and better will take its place.

On October 11th we had our Annual Club Business Meeting. Because I was at work I really do not know what happened.

On October 19th we were at Prime Desert Woodlands for the Moon Walk. I was out of town so I missed it; I was told that 108 people showed up for the walk. I would like to thank all the members who showed up and shared the night sky with the public.

On October 25th we were scheduled to do a Star Party at the College of the Canyon but it got canceled due to the fire in Canyon Country.

On October 26th we had our Dark Sky Party at Red Cliff. When I got there, Rod was waiting for someone to show up. There was a little wind but not enough to chase us away. Rod, Phil, Bob and I set up our scopes. A non-member showed up in the dark with his telescope that he got from Tom Hames but was having trouble focusing it. Rod and I figured it out and got him going. Then about 9:30pm, Ann showed up, that's when the strong winds started. We couldn't help not teasing her about the wind that she brought with her. At 11:30pm we had enough of the wind and started to tear down. Bob and I went home, but Rod and Phil stayed the night.



On November 2nd we have a Lunar Star Party at Judy's house.

On November 8th at our Club Meeting we again will have a painting art class from Tom Hames. Then on November 16th is our next Prime Desert Moon Walk, I hope to see you all there.

Secretary

Rose Moore

Our upcoming meeting on Friday Nov. 8th will be an astronomy painting class hosted by member Tom Hames. This is our last meeting for 2019. We will be setting up in the same cafeteria room in the school as the last class with Tom. The canvases will be already painted black prior to the class. Please pay our treasurer Rod at the meeting. The cost will be \$5 per member. This will be open to the public, and the cost for non-members will be \$10 per person. ****Please notify me if you are going to attend the class so that I can keep an accurate list of who is attending!****

We have our last Lunar Club event for Saturday Nov. 2nd at member Judy Fuentes' home in Antelope Acres. This is an event for members and their guest(s) only, and is not open to the public. Judy's address is: 47458 - 92nd St West, Antelope Acres, 93536. Weather permitting. If you don't have a scope, come out anyway as there are always plenty of scopes to view through. We will have a crescent moon.

On Saturday Nov. 16th is a Prime Desert Moon Walk with Jeremy. Start time is 5:30pm, and set up time is 30-60 minutes prior to the event. Weather permitting. We need members with telescopes for this event.

The Christmas Party is scheduled for Saturday Dec. 7th at 6-9:30pm at Gino's Restaurant. This is located in the Lancaster Marketplace, 44960 Valley Central Way, Lancaster, 93536. The deadline to pay is Nov. 24th. We have to give the restaurant a head count by that date. The meal will consist of a buffet: Chicken Parmigiana, Lasagna (meat), Penne Pasta Primavera (Vegetarian), Salad, Garlic Bread, Ice tea, Coffee, Soda, Dessert. The cost per member and their guest(s) is \$25 per person. Information was sent out in an email on Oct. 9th. Another will be sent out shortly.

Please pay for the Christmas dinner by: 1) Paypal via the link here: <http://www.avastronomyclub.org/christmas.html> or on the homepage on our website. 2) Pay our treasurer Rod at the next meeting on November 8th, either with cash or check. 3) You may mail in the payment by check to the AVAC postal address: AVAC, P.O. Box 8545, Lancaster, CA 93539. The check must reach us before the deadline of Nov. 24th. If any questions, please call or email a Board member!

We had our Annual Business meeting in October and there were only 13 members present. We elected the following Board for 2020: President Matt Leone, VP Darrell Bennett, Treasurer Rod Girard, Secretary Rose Moore. The position of Director of Community Development is being temporarily suspended at this time.

Space Place

The Messenger Crosses the Sun: Mercury Transit 2019

By David Prosper

Did you know that there are two other objects in our skies that have phases like the Moon? They're the inner planets, found between Earth and the Sun: Mercury and Venus. You can see their phases if you observe them through a telescope. Like our Moon, you can't see the planets in their "new" phase, unless they are lined up perfectly between us Earthlings and the Sun. In the case of the Moon, this alignment results in a **solar eclipse**; in the case of Mercury and Venus, this results in a **transit**, where the small disc of the planet travels across the face of the Sun. Skywatchers are in for a treat this month, as Mercury transits the Sun the morning of **November 11!**

You may have seen the transit of Venus in 2012; you may have even watched it through eclipse glasses! However, this time you'll need a solar telescope to see anything, since eclipse glasses will only reveal the Sun's blank face. Why is that? Mercury is the smallest planet in our solar system, and closer to the Sun (and further away from Earth) during its transit than Venus was in its 2012 transit. This makes Mercury's disc too small to see without the extra power of a telescope. Make absolutely certain that you view the transit via a telescope equipped with a safe solar filter or projection setup. Do NOT combine binoculars with your eclipse glasses; this will instantly burn a hole through the glasses – and your eyes! While most people don't have solar telescopes handy, many astronomy clubs do! Look for clubs hosting Mercury transit observing events near you at bit.ly/findnsn (USA) or at bit.ly/awbtransit (worldwide).

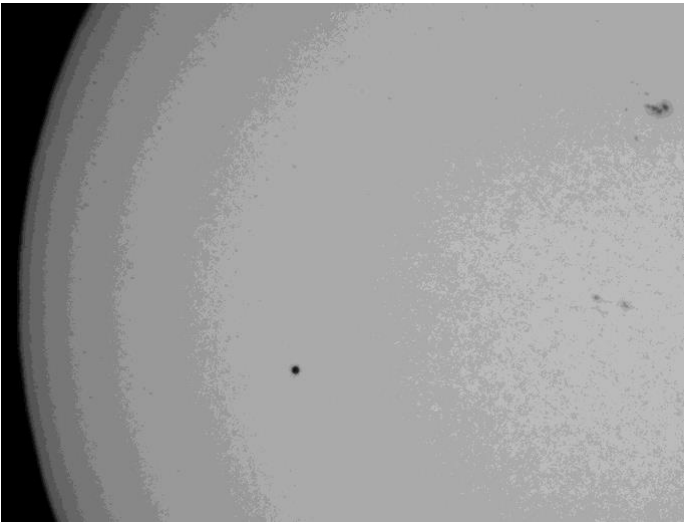
What a fun opportunity to see another planet during the day! This transit is expected to last over five hours. Folks on the East Coast will be able to watch the entire transit, weather permitting, from approximately 7:35 am EST until around approximately 1:04 pm EST. Folks located in the middle of North America to the west coast will see the transit already in progress at sunrise. The transit takes hours, so if your weather is cloudy, don't despair; there will be plenty of time for skies to clear! You can find timing details and charts via eclipse guru Fred Espenak's website: bit.ly/mercurytransit2019

Mercury's orbit is small and swift, and so its position in our skies quickly changes; that's why it was named after the fleet-footed messenger god of Roman mythology. In fact, if you have a clear view of the eastern horizon, you'll be able to catch Mercury again this month! Look for it before dawn during the last week of November, just above the eastern horizon and below red Mars. Wake up early the morning of November 24th to see Mars, the Moon, and Mercury form a loose triangle right before sunrise.

Discover more about Mercury and the rest of our solar system at nasa.gov



Photo of the May 9, 2016 transit of Mercury. Mercury is the small dot on the center right. Note how tiny it is, even compared to the small sunspot on the center left. Credit: Dave Huntz



This photo from the same 2016 transit event shows Mercury a bit larger, as it should; it was taken at a higher magnification through a large 16 inch telescope! Credit: J. A. Blackwell

This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events, and more!

News Headlines

Caltech, NASA Find Web of Ruptures in Ridgecrest Quake

A new study of Southern California's largest earthquake sequence in two decades provides new evidence that large earthquakes can occur in a more complex fashion than commonly assumed. The analysis by geophysicists from Caltech and NASA's Jet Propulsion Laboratory, both in Pasadena, California, documents a series of ruptures in a web of interconnected faults, with rupturing faults triggering other faults.

<https://go.nasa.gov/2J5OJvC>

November 11 Mercury Transit in Palmdale, CA, USA

This Transit of Mercury will be visible—weather permitting—for at least several hours in most of the world, including the US, South America, Africa, and Europe.

Begins: Mon, Nov 11, 2019 at 6:22 am (in progress at sunrise)

Midpoint: Mon, Nov 11, 2019 at 7:20 am

Ends: Mon, Nov 11, 2019 at 10:04 am

Duration: 3 hours, 43 minutes

<https://www.timeanddate.com/eclipse/in/usa/palmdale>

NASA Steps Towards Modernizing Planetary Protection Guidelines

A panel of academic and industry experts convened by NASA to assess the need to modernize planetary protection principles released more than 80 findings and recommendations on Friday. Chaired by planetary scientist Alan Stern (Principal Investigator of the New Horizons mission), the panel concluded that not only do existing principles need to be updated, but NASA should revisit these issues at least twice a decade as more and more knowledge is gained about the solar system

<https://bit.ly/2J8BaLE>

Hubble Observes New Interstellar Visitor

On 12 October 2019, the NASA/ESA Hubble Space Telescope provided astronomers with their best look yet at an interstellar visitor — Comet 2I/Borisov — which is believed to have arrived here from another planetary system elsewhere in our galaxy. This observation is the sharpest view ever of the interstellar comet. Hubble reveals a central concentration of dust around the solid icy nucleus. Comet 2I/Borisov is only the second such interstellar object known to have passed through our Solar System. In 2017, the first identified interstellar visitor, an object dubbed 'Oumuamua, swung within 38 million kilometers of the Sun before racing out of the Solar System.

<https://bit.ly/2oPPCl4>

November Sky Data

First Qtr Nov 4 Full Nov 12 Last Qtr Nov 19 New Nov 26



Planet Summary

Following its transit of the Sun on the 11th, **Mercury** rises rapidly into the pre-dawn sky, increasing in brightness by half a magnitude each day and rising about 7 minutes earlier as the days progress. The rates slow until Mercury reaches greatest western elongation some 20 degrees in angle from the Sun on the 28th.

Venus may just be glimpsed in the west south-west setting an hour after the Sun at the start of the month, but will be difficult to see due to the fact that the ecliptic is at a shallow angle to the horizon and so Venus will have a very low elevation. Its magnitude remains at about -3.4 and its, almost fully illuminated disk, ~11 arc seconds across.

Mars can be seen in the pre-dawn sky at the start of its new apparition. It might just be glimpsed just south of east at the start of the month but will then only have an elevation of ~11 degrees at sunrise. By the end of the month, Mars rises some two and a half hours before the Sun with disk still less than 4 arc seconds across.

Jupiter, shining on the 1st at magnitude -1.5 and falling to -1.4 during the month, can be seen very low in the southwest as darkness falls. As the month progresses, its angular size drops from 33.4 to 32.1 arc seconds - but, by the end of the month, will be lost in the Sun's glare.

Saturn will be seen just west of south as darkness falls at the start of the month. Then, its disk is ~16 arc seconds across and its rings - which are still, at 25.2 degrees, nicely tilted from the line of sight - spanning some 39 arc seconds across. During the month its brightness remains +1.6. and will only reach an elevation of ~13 degrees.

November's wonderful Leonid **meteor shower** happens every year around November 17 or 18, as our world crosses the orbital path of Comet 55P/Tempel-Tuttle. In 2019, the peak of the shower is expected to be from midnight to dawn on Monday, November 18. However, a waning gibbous moon will light up the morning sky this year, to obtrude on this year's Leonid meteor shower.

Sun and Moon Rise and Set

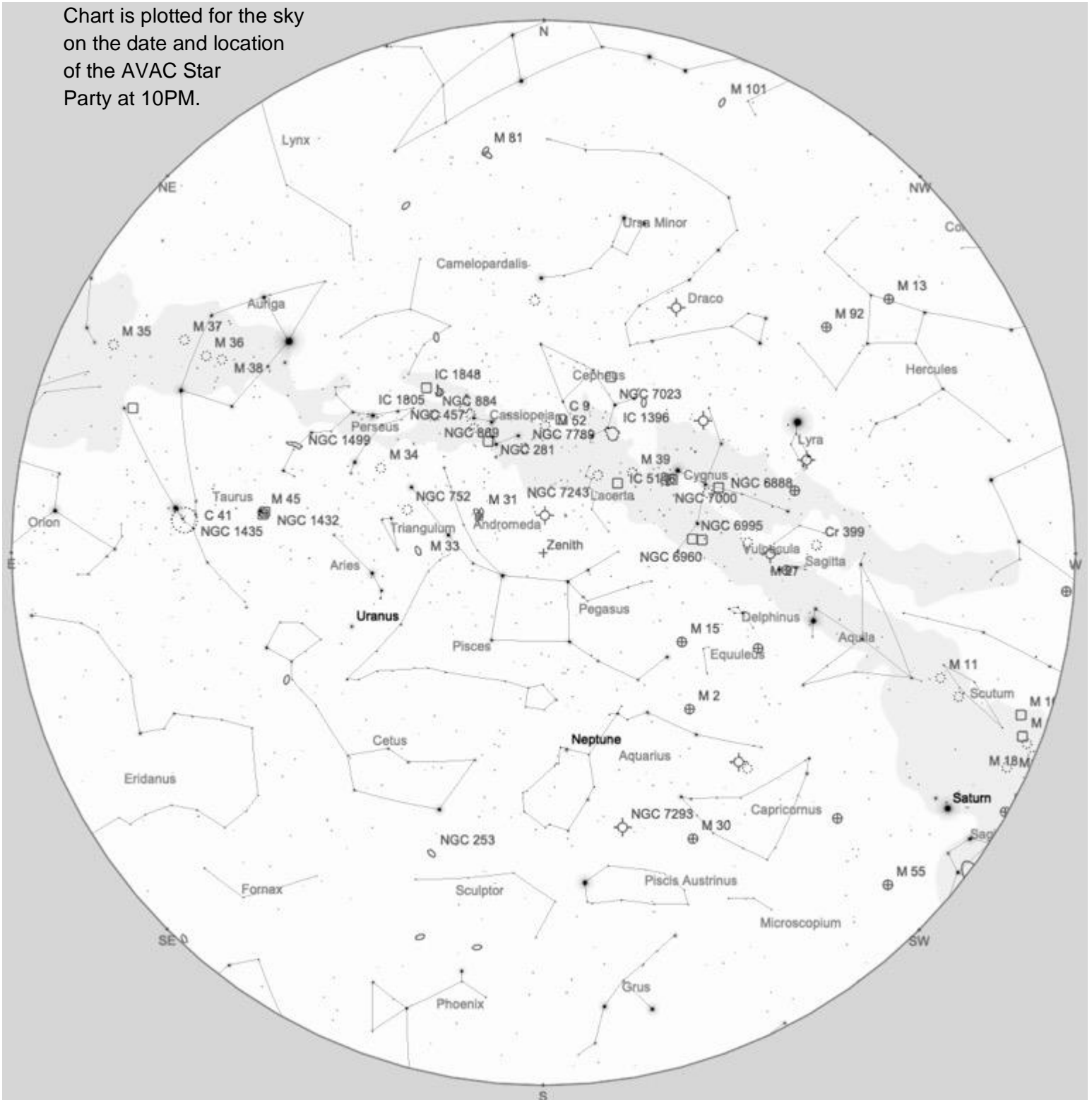
| Date | Moonrise | Moonset | Sunrise | Sunset |
|------------|----------|---------|---------|--------|
| 11/1/2019 | 11:55 | 22:03 | 07:13 | 17:59 |
| 11/5/2019 | 13:48 | n/a | 06:16 | 16:56 |
| 11/10/2019 | 16:14 | 04:25 | 06:21 | 16:51 |
| 11/15/2019 | 19:35 | 09:23 | 06:26 | 16:48 |
| 11/20/2019 | n/a | 13:25 | 06:30 | 16:45 |
| 11/25/2019 | 05:23 | 16:27 | 06:35 | 16:43 |
| 11/30/2019 | 10:25 | 20:42 | 06:40 | 16:42 |

Planet Data

| | Nov 1 | | | |
|----------------|--------|---------|-------|------|
| | Rise | Transit | Set | Mag |
| Mercury | 08:51 | 13:51 | 18:50 | 0.8 |
| Venus | 08:56 | 14:01 | 19:06 | -3.3 |
| Mars | 05:35 | 11:21 | 17:07 | 2.0 |
| Jupiter | 10:47 | 15:43 | 20:40 | -1.5 |
| Saturn | 12:21 | 17:19 | 22:17 | 1.6 |
| | Nov 15 | | | |
| | Rise | Transit | Set | Mag |
| Mercury | 05:44 | 11:05 | 16:27 | 1.7 |
| Venus | 08:26 | 13:20 | 18:14 | -3.3 |
| Mars | 04:24 | 10:00 | 15:36 | 2.0 |
| Jupiter | 09:05 | 14:00 | 18:56 | -1.4 |
| Saturn | 10:30 | 15:28 | 20:27 | 1.6 |
| | Nov 31 | | | |
| | Rise | Transit | Set | Mag |
| Mercury | 05:02 | 10:23 | 15:44 | -0.4 |
| Venus | 08:52 | 13:42 | 18:33 | -3.4 |
| Mars | 04:13 | 09:39 | 15:05 | 1.9 |
| Jupiter | 08:20 | 13:15 | 18:11 | -1.4 |
| Saturn | 09:36 | 14:35 | 19:34 | 1.6 |

Planet, Sun, and Moon data calculated for local time at Lancaster, CA

Chart is plotted for the sky on the date and location of the AVAC Star Party at 10PM.



To use the chart, go outside within an hour or so of the time listed and hold it up to the sky. Turn the chart so the direction you are looking is at the bottom of the chart. If you are looking to the south then have 'South horizon' at the lower edge.

Suggested Observing List

The list below contains objects that will be visible on the night of the AVAC Star Party. The list is sorted by the transit time of the object.

| ID | Type | Const | RA | Dec | Mag | Rise | Transit | Set |
|---------|-------|-------|-------------|------------|------|--------|---------|--------|
| M39 | Open | Cyg | 21h 31m 42s | +48°25'00" | 5.5 | 10:55 | 20:20 | 05:45 |
| M2 | Glob | Aqr | 21h 33m 27s | -00°49'23" | 7.5 | 14:21 | 20:22 | 02:22 |
| M30 | Glob | Cap | 21h 40m 22s | -23°10'45" | 8.5 | 15:33 | 20:29 | 01:25 |
| NGC7155 | Gal | Ind | 21h 56m 10s | -49°31'17" | 13.0 | 18:07 | 20:45 | 23:22 |
| NGC7209 | Open | Lac | 22h 05m 07s | +46°29'00" | 6.7 | 11:46 | 20:54 | 06:01 |
| NGC7196 | Gal | Ind | 22h 05m 55s | -50°07'10" | 11.5 | 18:23 | 20:54 | 23:26 |
| NGC7217 | Gal | Peg | 22h 07m 52s | +31°21'33" | 10.2 | 13:16 | 20:56 | 04:37 |
| NGC7300 | Gal | Aqr | 22h 31m 00s | -14°00'12" | 12.9 | 15:55 | 21:19 | 02:44 |
| NGC7354 | P Neb | Cep | 22h 40m 20s | +61°17'07" | 13.0 | Circum | 21:29 | Circum |
| NGC7380 | Open | Cep | 22h 47m 21s | +58°07'54" | 7.2 | Circum | 21:36 | Circum |
| NGC7457 | Gal | Peg | 23h 01m 00s | +30°08'41" | 10.8 | 14:14 | 21:49 | 05:25 |
| NGC7479 | Gal | Peg | 23h 04m 57s | +12°19'20" | 11.0 | 15:17 | 21:53 | 04:30 |
| NGC7492 | Glob | Aqr | 23h 08m 27s | -15°36'41" | 11.5 | 16:38 | 21:57 | 03:16 |
| NGC7510 | Open | Cep | 23h 11m 04s | +60°34'15" | 7.9 | Circum | 22:00 | Circum |
| NGC7538 | Neb | Cep | 23h 13m 38s | +61°30'42" | | Circum | 22:02 | Circum |
| NGC7585 | Gal | Aqr | 23h 18m 01s | -04°39'03" | 11.7 | 16:16 | 22:06 | 03:57 |
| NGC7606 | Gal | Aqr | 23h 19m 05s | -08°29'09" | 10.8 | 16:28 | 22:08 | 03:47 |
| NGC7635 | Neb | Cas | 23h 20m 45s | +61°12'42" | | Circum | 22:09 | Circum |
| NGC7640 | Gal | And | 23h 22m 07s | +40°50'43" | 10.9 | 13:43 | 22:11 | 06:38 |
| NGC7648 | Gal | Peg | 23h 23m 54s | +09°40'04" | 14.0 | 15:43 | 22:12 | 04:42 |
| NGC7662 | P Neb | And | 23h 25m 54s | +42°32'06" | 9.0 | 13:36 | 22:14 | 06:52 |
| NGC7686 | Open | And | 23h 30m 07s | +49°08'00" | 5.6 | 12:46 | 22:19 | 07:51 |
| NGC7706 | Gal | Psc | 23h 35m 10s | +04°57'51" | 14.0 | 16:07 | 22:24 | 04:40 |
| NGC7723 | Gal | Aqr | 23h 38m 57s | -12°57'40" | 11.1 | 17:00 | 22:27 | 03:54 |
| NGC7741 | Gal | Peg | 23h 43m 54s | +26°04'32" | 11.4 | 15:12 | 22:32 | 05:53 |
| NGC7762 | Open | Cep | 23h 50m 01s | +68°02'18" | 10.0 | Circum | 22:38 | Circum |
| NGC7782 | Gal | Psc | 23h 53m 54s | +07°58'14" | 13.0 | 16:18 | 22:42 | 05:07 |
| NGC7785 | Gal | Psc | 23h 55m 19s | +05°54'56" | 11.6 | 16:25 | 22:44 | 05:03 |
| NGC7788 | Open | Cas | 23h 56m 46s | +61°23'59" | 9.0 | Circum | 22:45 | Circum |
| NGC7789 | Open | Cas | 23h 57m 24s | +56°42'30" | 6.7 | Circum | 22:46 | Circum |
| NGC7790 | Open | Cas | 23h 58m 24s | +61°12'30" | 8.5 | Circum | 22:47 | Circum |
| NGC7814 | Gal | Peg | 00h 03m 15s | +16°08'43" | 10.5 | 16:04 | 22:52 | 05:40 |
| NGC7822 | Neb | Cep | 00h 03m 36s | +67°09'00" | | Circum | 22:52 | Circum |
| NGC7821 | Gal | Cet | 00h 05m 17s | -16°28'37" | 14.0 | 17:37 | 22:54 | 04:11 |
| NGC40 | P Neb | Cep | 00h 13m 01s | +72°31'19" | 11.0 | Circum | 23:01 | Circum |
| NGC55 | Gal | Scl | 00h 15m 08s | -39°13'12" | 8.0 | 19:13 | 23:04 | 02:54 |
| NGC80 | Gal | And | 00h 21m 11s | +22°21'26" | 12.1 | 16:02 | 23:10 | 06:17 |
| NGC133 | Open | Cas | 00h 31m 19s | +63°21'00" | 9.0 | Circum | 23:20 | Circum |
| NGC146 | Open | Cas | 00h 33m 03s | +63°18'06" | 9.1 | Circum | 23:22 | Circum |

| ID | Type | Const | RA | Dec | Mag | Rise | Transit | Set |
|---------|-------|-------|-------------|------------|------|--------|---------|--------|
| NGC187 | Gal | Cet | 00h 39m 30s | -14°39'22" | 13.0 | 18:06 | 23:28 | 04:50 |
| M31 | Gal | And | 00h 42m 44s | +41°16'08" | 4.3 | 15:01 | 23:31 | 08:01 |
| NGC225 | Open | Cas | 00h 43m 39s | +61°46'30" | 7.0 | Circum | 23:32 | Circum |
| NGC246 | P Neb | Cet | 00h 47m 03s | -11°52'19" | 8.0 | 18:05 | 23:36 | 05:06 |
| NGC278 | Gal | Cas | 00h 52m 04s | +47°33'02" | 10.9 | 14:24 | 23:41 | 08:57 |
| NGC288 | Glob | Scl | 00h 52m 45s | -26°35'01" | 8.1 | 18:57 | 23:41 | 04:25 |
| NGC315 | Gal | Psc | 00h 57m 49s | +30°21'08" | 13.0 | 16:10 | 23:46 | 07:23 |
| NGC436 | Open | Cas | 01h 15m 58s | +58°48'42" | 8.8 | Circum | 00:04 | Circum |
| NGC584 | Gal | Cet | 01h 31m 21s | -06°52'05" | 10.4 | 18:36 | 00:20 | 06:04 |
| NGC579 | Gal | Tri | 01h 31m 47s | +33°36'56" | 13.0 | 16:30 | 00:20 | 08:11 |
| NGC596 | Gal | Cet | 01h 32m 52s | -07°01'56" | 10.9 | 18:38 | 00:21 | 06:05 |
| M33 | Gal | Tri | 01h 33m 51s | +30°39'37" | 6.2 | 16:44 | 00:22 | 08:00 |
| M76 | P Neb | Per | 01h 42m 18s | +51°34'15" | 12.0 | 14:28 | 00:31 | 10:33 |
| NGC660 | Gal | Psc | 01h 43m 02s | +13°38'39" | 10.8 | 17:51 | 00:32 | 07:12 |
| NGC681 | Gal | Cet | 01h 49m 11s | -10°25'37" | 11.8 | 19:03 | 00:38 | 06:12 |
| NGC752 | Open | And | 01h 57m 41s | +37°47'06" | 5.7 | 16:36 | 00:46 | 08:57 |
| NGC821 | Gal | Ari | 02h 08m 21s | +10°59'41" | 10.8 | 18:24 | 00:57 | 07:30 |
| NGC869 | Open | Per | 02h 19m 00s | +57°07'42" | 4.0 | Circum | 01:07 | Circum |
| NGC884 | Open | Per | 02h 22m 18s | +57°08'12" | 4.0 | Circum | 01:11 | Circum |
| NGC896 | Neb | Cas | 02h 25m 28s | +62°01'09" | | Circum | 01:14 | Circum |
| NGC957 | Open | Per | 02h 33m 21s | +57°33'36" | 7.6 | Circum | 01:22 | Circum |
| NGC991 | Gal | Cet | 02h 35m 33s | -07°09'16" | 12.0 | 19:41 | 01:24 | 07:07 |
| NGC1058 | Gal | Per | 02h 43m 30s | +37°20'28" | 11.5 | 17:24 | 01:32 | 09:40 |
| NGC1087 | Gal | Cet | 02h 46m 25s | -00°29'56" | 11.0 | 19:34 | 01:35 | 07:36 |
| NGC1121 | Gal | Eri | 02h 50m 39s | -01°44'02" | 13.0 | 19:41 | 01:39 | 07:37 |
| NGC1156 | Gal | Ari | 02h 59m 42s | +25°14'17" | 11.7 | 18:31 | 01:48 | 09:06 |
| NGC1207 | Gal | Per | 03h 08m 15s | +38°22'56" | 13.0 | 17:43 | 01:57 | 10:10 |
| NGC1261 | Glob | Hor | 03h 12m 16s | -55°12'57" | 8.4 | 00:49 | 02:01 | 03:12 |
| NGC1256 | Gal | Eri | 03h 13m 58s | -21°59'11" | 14.0 | 21:03 | 02:02 | 07:02 |
| NGC1291 | Gal | Eri | 03h 17m 18s | -41°06'29" | 8.5 | 22:26 | 02:06 | 05:46 |
| NGC1326 | Gal | For | 03h 23m 56s | -36°27'51" | 10.5 | 22:08 | 02:12 | 06:16 |
| NGC1344 | Gal | For | 03h 28m 19s | -31°04'05" | 10.3 | 21:49 | 02:17 | 06:44 |
| NGC1333 | Neb | Per | 03h 29m 20s | +31°24'56" | | 18:37 | 02:18 | 09:59 |
| NGC1342 | Open | Per | 03h 31m 38s | +37°22'36" | 6.7 | 18:12 | 02:20 | 10:28 |
| NGC1343 | Gal | Cas | 03h 37m 50s | +72°34'16" | 12.3 | Circum | 02:26 | Circum |
| NGC1432 | Neb | Tau | 03h 45m 50s | +24°22'06" | | 19:20 | 02:34 | 09:49 |
| NGC1435 | Neb | Tau | 03h 46m 10s | +23°45'54" | | 19:22 | 02:35 | 09:47 |
| M45 | Open | Tau | 03h 47m 30s | +24°07'00" | 1.6 | 19:22 | 02:36 | 09:50 |
| NGC1491 | Neb | Per | 04h 03m 14s | +51°18'57" | | 16:53 | 02:52 | 12:50 |
| NGC1499 | Neb | Per | 04h 03m 14s | +36°22'00" | | 18:48 | 02:52 | 10:55 |
| NGC1496 | Open | Per | 04h 04m 32s | +52°39'42" | 10.0 | 16:33 | 02:53 | 13:13 |
| NGC1501 | P Neb | Cam | 04h 06m 59s | +60°55'14" | 13.0 | Circum | 02:55 | Circum |
| NGC1502 | Open | Cam | 04h 07m 50s | +62°19'54" | 5.7 | Circum | 02:56 | Circum |
| NGC1514 | P Neb | Tau | 04h 09m 17s | +30°46'33" | 10.0 | 19:19 | 02:58 | 10:36 |
| NGC1531 | Gal | Eri | 04h 11m 59s | -32°51'02" | 12.1 | 22:40 | 03:00 | 07:21 |

| ID | Type | Const | RA | Dec | Mag | Rise | Transit | Set |
|---------|-------|-------|-------------|------------|------|--------|---------|--------|
| NGC1535 | P Neb | Eri | 04h 14m 16s | -12°44'22" | 10.0 | 21:35 | 03:03 | 08:30 |
| NGC1528 | Open | Per | 04h 15m 23s | +51°12'54" | 6.4 | 17:07 | 03:04 | 13:01 |
| NGC1549 | Gal | Dor | 04h 15m 45s | -55°35'31" | 9.9 | 02:04 | 03:04 | 04:04 |
| NGC1545 | Open | Per | 04h 20m 57s | +50°15'12" | 6.2 | 17:24 | 03:09 | 12:54 |
| NGC1579 | Neb | Per | 04h 30m 14s | +35°16'47" | | 19:21 | 03:19 | 11:17 |
| NGC1617 | Gal | Dor | 04h 31m 39s | -54°36'06" | 10.4 | 01:54 | 03:20 | 04:46 |
| NGC1582 | Open | Per | 04h 31m 53s | +43°49'00" | 7.0 | 18:34 | 03:20 | 12:07 |
| NGC1605 | Open | Per | 04h 34m 53s | +45°16'12" | 10.7 | 18:26 | 03:23 | 12:21 |
| NGC1724 | Open | Aur | 05h 03m 32s | +49°29'30" | 10.0 | 18:16 | 03:52 | 13:28 |
| NGC1792 | Gal | Col | 05h 05m 14s | -37°58'49" | 10.2 | 23:57 | 03:54 | 07:50 |
| NGC1788 | Neb | Ori | 05h 06m 53s | -03°20'27" | | 22:02 | 03:55 | 09:49 |
| NGC1817 | Open | Tau | 05h 12m 15s | +16°41'24" | 7.7 | 21:11 | 04:01 | 10:50 |
| NGC1851 | Glob | Col | 05h 14m 07s | -40°02'46" | 7.3 | 00:17 | 04:03 | 07:48 |
| M79 | Glob | Lep | 05h 24m 11s | -24°31'29" | 8.5 | 23:21 | 04:13 | 09:04 |
| NGC1907 | Open | Aur | 05h 28m 05s | +35°19'30" | 8.2 | 20:18 | 04:17 | 12:15 |
| NGC1952 | Neb | Tau | 05h 34m 32s | +22°00'52" | 8.4 | 21:16 | 04:23 | 11:30 |
| NGC1973 | Neb | Ori | 05h 35m 05s | -04°43'55" | | 22:34 | 04:24 | 10:13 |
| NGC1981 | Open | Ori | 05h 35m 09s | -04°25'54" | 4.6 | 22:33 | 04:24 | 10:14 |
| NGC1977 | Neb | Ori | 05h 35m 16s | -04°49'15" | | 22:34 | 04:24 | 10:13 |
| M42 | D Neb | Ori | 05h 35m 16s | -05°23'25" | 4.0 | 22:36 | 04:24 | 10:12 |
| NGC1975 | Neb | Ori | 05h 35m 18s | -04°41'05" | | 22:34 | 04:24 | 10:14 |
| NGC1980 | Neb | Ori | 05h 35m 25s | -05°54'54" | | 22:37 | 04:24 | 10:11 |
| M43 | D Neb | Ori | 05h 35m 31s | -05°16'03" | 9.0 | 22:36 | 04:24 | 10:12 |
| NGC1990 | Neb | Ori | 05h 36m 13s | -01°12'07" | | 22:25 | 04:25 | 10:24 |
| M36 | Open | Aur | 05h 36m 18s | +34°08'24" | 6.5 | 20:32 | 04:25 | 12:18 |
| NGC1999 | Neb | Ori | 05h 36m 25s | -06°42'57" | | 22:40 | 04:25 | 10:09 |
| NGC2023 | Neb | Ori | 05h 41m 38s | -02°15'33" | | 22:33 | 04:30 | 10:27 |
| NGC2024 | Neb | Ori | 05h 41m 42s | -01°51'24" | | 22:32 | 04:30 | 10:28 |
| NGC1961 | Gal | Cam | 05h 42m 05s | +69°22'43" | 11.1 | Circum | 04:31 | Circum |
| NGC2022 | P Neb | Ori | 05h 42m 06s | +09°05'13" | 12.0 | 22:03 | 04:31 | 10:58 |
| NGC2064 | Neb | Ori | 05h 46m 18s | +00°00'21" | | 22:32 | 04:35 | 10:38 |
| NGC2067 | Neb | Ori | 05h 46m 31s | +00°07'54" | | 22:32 | 04:35 | 10:38 |
| M78 | D Neb | Ori | 05h 46m 45s | +00°04'48" | 8.0 | 22:32 | 04:35 | 10:38 |
| NGC2071 | Neb | Ori | 05h 47m 07s | +00°17'39" | | 22:32 | 04:36 | 10:39 |
| NGC2112 | Open | Ori | 05h 53m 45s | +00°24'36" | 9.0 | 22:38 | 04:42 | 10:46 |
| NGC2149 | Neb | Mon | 06h 03m 31s | -09°43'50" | | 23:16 | 04:52 | 10:28 |
| NGC2170 | Neb | Mon | 06h 07m 32s | -06°23'57" | | 23:11 | 04:56 | 10:41 |
| NGC2169 | Open | Ori | 06h 08m 24s | +13°57'54" | 5.9 | 22:15 | 04:57 | 11:38 |
| M35 | Open | Gem | 06h 09m 00s | +24°21'00" | 5.5 | 21:43 | 04:57 | 12:12 |
| NGC2174 | Neb | Ori | 06h 09m 24s | +20°39'34" | | 21:56 | 04:58 | 12:00 |
| NGC2182 | Neb | Mon | 06h 09m 31s | -06°19'35" | | 23:12 | 04:58 | 10:44 |
| NGC2183 | Neb | Mon | 06h 10m 47s | -06°12'43" | | 23:13 | 04:59 | 10:45 |
| NGC2185 | Neb | Mon | 06h 11m 00s | -06°13'36" | | 23:14 | 04:59 | 10:45 |
| NGC2194 | Open | Ori | 06h 13m 45s | +12°48'24" | 8.5 | 22:24 | 05:02 | 11:40 |
| NGC2204 | Open | CMa | 06h 15m 33s | -18°39'54" | 8.6 | 23:54 | 05:04 | 10:14 |

| ID | Type | Const | RA | Dec | Mag | Rise | Transit | Set |
|---------|-------|-------|-------------|------------|------|--------|---------|--------|
| NGC2223 | Gal | CMa | 06h 24m 36s | -22°50'19" | 11.4 | 00:16 | 05:13 | 10:10 |
| NGC2232 | Open | Mon | 06h 28m 01s | -04°50'48" | 3.9 | 23:27 | 05:16 | 11:06 |
| NGC2244 | Open | Mon | 06h 31m 56s | +04°56'35" | 4.8 | 23:04 | 05:20 | 11:37 |
| NGC2245 | Neb | Mon | 06h 32m 41s | +10°09'24" | | 22:51 | 05:21 | 11:52 |
| NGC2247 | Neb | Mon | 06h 33m 05s | +10°19'17" | | 22:50 | 05:22 | 11:53 |
| NGC2242 | P Neb | Aur | 06h 34m 07s | +44°46'38" | 14.0 | 20:29 | 05:23 | 14:16 |
| NGC2261 | Neb | Mon | 06h 39m 10s | +08°44'40" | | 23:01 | 05:28 | 11:54 |
| NGC2264 | Open | Mon | 06h 40m 58s | +09°53'42" | 3.9 | 23:00 | 05:29 | 11:59 |
| NGC2269 | Open | Mon | 06h 43m 17s | +04°37'30" | 10.0 | 23:16 | 05:32 | 11:47 |
| M41 | Open | CMa | 06h 46m 01s | -20°45'24" | 5.0 | 00:31 | 05:34 | 10:38 |
| NGC2282 | Neb | Mon | 06h 46m 51s | +01°18'56" | | 23:29 | 05:35 | 11:42 |
| NGC2281 | Open | Aur | 06h 48m 17s | +41°04'42" | 5.4 | 21:08 | 05:37 | 14:06 |
| NGC2298 | Glob | Pup | 06h 48m 59s | -36°00'15" | 9.4 | 01:31 | 05:37 | 09:44 |
| NGC2301 | Open | Mon | 06h 51m 45s | +00°27'36" | 6.0 | 23:36 | 05:40 | 11:44 |
| NGC2302 | Open | Mon | 06h 51m 55s | -07°05'00" | 8.9 | 23:57 | 05:40 | 11:24 |
| NGC2304 | Open | Gem | 06h 55m 11s | +17°59'18" | 10.0 | 22:50 | 05:44 | 12:37 |
| NGC2311 | Open | Mon | 06h 57m 47s | -04°36'42" | 10.0 | 23:56 | 05:46 | 11:36 |
| NGC2316 | Neb | Mon | 06h 59m 41s | -07°46'39" | | 00:07 | 05:48 | 11:30 |
| NGC2324 | Open | Mon | 07h 04m 07s | +01°02'42" | 8.4 | 23:47 | 05:53 | 11:58 |
| NGC2335 | Open | Mon | 07h 06m 49s | -10°01'42" | 7.2 | 00:20 | 05:55 | 11:31 |
| NGC2345 | Open | CMa | 07h 08m 18s | -13°11'36" | 7.7 | 00:30 | 05:57 | 11:23 |
| NGC2354 | Open | CMa | 07h 14m 10s | -25°41'24" | 6.5 | 01:15 | 06:03 | 10:50 |
| NGC2360 | Open | CMa | 07h 17m 43s | -15°38'30" | 7.2 | 00:47 | 06:06 | 11:25 |
| NGC2359 | Neb | CMa | 07h 18m 30s | -13°13'36" | | 00:41 | 06:07 | 11:33 |
| NGC2362 | Open | CMa | 07h 18m 41s | -24°57'18" | 4.1 | 01:17 | 06:07 | 10:57 |
| NGC2374 | Open | CMa | 07h 23m 56s | -13°15'48" | 8.0 | 00:46 | 06:12 | 11:39 |
| NGC2371 | P Neb | Gem | 07h 25m 34s | +29°29'17" | 13.0 | 22:41 | 06:14 | 13:47 |
| NGC2395 | Open | Gem | 07h 27m 12s | +13°36'30" | 8.0 | 23:35 | 06:16 | 12:56 |
| NGC2396 | Open | Pup | 07h 28m 00s | -11°43'00" | 7.0 | 00:46 | 06:16 | 11:47 |
| NGC2392 | P Neb | Gem | 07h 29m 11s | +20°54'42" | 10.0 | 23:15 | 06:18 | 13:21 |
| M47 | Open | Pup | 07h 36m 35s | -14°29'00" | 4.5 | 01:02 | 06:25 | 11:48 |
| NGC2423 | Open | Pup | 07h 37m 06s | -13°52'18" | 6.7 | 01:01 | 06:26 | 11:50 |
| NGC2419 | Glob | Lyn | 07h 38m 08s | +38°52'54" | 10.4 | 22:10 | 06:27 | 14:43 |
| NGC2424 | Gal | Lyn | 07h 40m 39s | +39°13'58" | 12.6 | 22:11 | 06:29 | 14:47 |
| NGC2439 | Open | Pup | 07h 40m 45s | -31°41'36" | 6.9 | 02:04 | 06:29 | 10:54 |
| NGC2432 | Open | Pup | 07h 40m 53s | -19°04'36" | 10.0 | 01:20 | 06:29 | 11:38 |
| M46 | Open | Pup | 07h 41m 46s | -14°48'36" | 6.5 | 01:09 | 06:30 | 11:52 |
| NGC2438 | P Neb | Pup | 07h 41m 50s | -14°44'07" | 10.0 | 01:08 | 06:30 | 11:52 |
| NGC2440 | P Neb | Pup | 07h 41m 55s | -18°12'31" | 11.0 | 01:19 | 06:30 | 11:42 |
| NGC2451 | Open | Pup | 07h 45m 15s | -37°58'00" | 2.8 | 02:37 | 06:34 | 10:30 |
| NGC2452 | P Neb | Pup | 07h 47m 26s | -27°20'07" | 13.0 | 01:54 | 06:36 | 11:17 |
| NGC2454 | Gal | Gem | 07h 50m 35s | +16°22'09" | 14.0 | 23:50 | 06:39 | 13:28 |
| NGC2477 | Open | Pup | 07h 52m 10s | -38°31'48" | 5.8 | 02:47 | 06:41 | 10:35 |
| NGC2469 | Gal | Lyn | 07h 58m 03s | +56°40'49" | 13.0 | Circum | 06:47 | Circum |
| NGC2509 | Open | Pup | 08h 00m 48s | -19°03'06" | 9.0 | 01:40 | 06:49 | 11:58 |

| ID | Type | Const | RA | Dec | Mag | Rise | Transit | Set |
|---------|-------|-------|-------------|------------|------|--------|---------|--------|
| NGC2533 | Open | Pup | 08h 07m 04s | -29°53'00" | 7.6 | 02:24 | 06:56 | 11:28 |
| NGC2547 | Open | Vel | 08h 10m 09s | -49°12'54" | 4.7 | 04:18 | 06:59 | 09:39 |
| NGC2537 | Gal | Lyn | 08h 13m 15s | +45°59'30" | 11.7 | 21:59 | 07:02 | 16:05 |
| M48 | Open | Hya | 08h 13m 43s | -05°45'00" | 5.5 | 01:15 | 07:02 | 12:49 |
| NGC2541 | Gal | Lyn | 08h 14m 40s | +49°03'43" | 11.8 | 21:32 | 07:03 | 16:35 |
| NGC2549 | Gal | Lyn | 08h 18m 58s | +57°48'10" | 11.1 | Circum | 07:07 | Circum |
| NGC2579 | Open | Pup | 08h 20m 53s | -36°13'00" | 7.5 | 03:04 | 07:09 | 11:15 |
| NGC2587 | Open | Pup | 08h 23m 25s | -29°30'30" | 9.0 | 02:38 | 07:12 | 11:45 |
| NGC2610 | P Neb | Hya | 08h 33m 23s | -16°08'57" | 14.0 | 02:04 | 07:22 | 12:40 |
| NGC2608 | Gal | Cnc | 08h 35m 17s | +28°28'24" | 12.1 | 23:54 | 07:24 | 14:53 |
| NGC2626 | Neb | Vel | 08h 35m 31s | -40°40'18" | | 03:42 | 07:24 | 11:06 |
| M44 | Open | Cnc | 08h 40m 24s | +19°40'00" | 4.0 | 00:30 | 07:29 | 14:28 |
| NGC2660 | Open | Vel | 08h 42m 38s | -47°12'00" | 8.8 | 04:33 | 07:31 | 10:29 |
| NGC2669 | Open | Vel | 08h 46m 22s | -52°56'54" | 6.1 | 05:39 | 07:35 | 09:30 |
| NGC2654 | Gal | UMa | 08h 49m 12s | +60°13'14" | 11.8 | Circum | 07:38 | Circum |
| NGC2672 | Gal | Cnc | 08h 49m 22s | +19°04'28" | 11.6 | 00:41 | 07:38 | 14:35 |
| M67 | Open | Cnc | 08h 51m 18s | +11°48'00" | 7.5 | 01:04 | 07:40 | 14:15 |
| NGC2655 | Gal | Cam | 08h 55m 38s | +78°13'24" | 10.1 | Circum | 07:44 | Circum |
| NGC2693 | Gal | UMa | 08h 56m 59s | +51°20'48" | 11.7 | 21:46 | 07:45 | 17:45 |
| NGC2712 | Gal | Lyn | 08h 59m 31s | +44°54'51" | 12.0 | 22:53 | 07:48 | 16:43 |
| NGC2715 | Gal | Cam | 09h 08m 06s | +78°05'08" | 11.4 | Circum | 07:57 | Circum |
| NGC2792 | P Neb | Vel | 09h 12m 27s | -42°25'41" | 14.0 | 04:29 | 08:01 | 11:33 |
| NGC2818 | Open | Pyx | 09h 16m 01s | -36°37'37" | 8.2 | 04:01 | 08:04 | 12:08 |
| NGC2811 | Gal | Hya | 09h 16m 11s | -16°18'47" | 11.3 | 02:47 | 08:05 | 13:22 |
| NGC2798 | Gal | Lyn | 09h 17m 23s | +42°00'00" | 12.3 | 23:31 | 08:06 | 16:40 |
| NGC2835 | Gal | Hya | 09h 17m 53s | -22°21'18" | 11.0 | 03:08 | 08:06 | 13:05 |
| NGC2832 | Gal | Lyn | 09h 19m 47s | +33°44'59" | 11.5 | 00:17 | 08:08 | 15:59 |
| NGC2805 | Gal | UMa | 09h 20m 21s | +64°06'11" | 11.3 | Circum | 08:09 | Circum |
| NGC2855 | Gal | Hya | 09h 21m 27s | -11°54'36" | 11.6 | 02:40 | 08:10 | 13:40 |
| NGC2841 | Gal | UMa | 09h 22m 03s | +50°58'35" | 9.3 | 22:16 | 08:11 | 18:05 |
| NGC2859 | Gal | LMi | 09h 24m 19s | +34°30'47" | 10.7 | 00:18 | 08:13 | 16:07 |
| NGC2874 | Gal | Leo | 09h 25m 48s | +11°25'30" | 14.0 | 01:40 | 08:14 | 14:48 |
| NGC2895 | Gal | UMa | 09h 32m 25s | +57°28'57" | 14.0 | Circum | 08:21 | Circum |
| NGC3003 | Gal | LMi | 09h 48m 36s | +33°25'17" | 11.7 | 00:47 | 08:37 | 16:27 |
| M81 | Gal | UMa | 09h 55m 33s | +69°03'56" | 7.8 | Circum | 08:44 | Circum |
| NGC3079 | Gal | UMa | 10h 01m 58s | +55°40'51" | 10.6 | Circum | 08:50 | Circum |
| NGC3109 | Gal | Hya | 10h 03m 06s | -26°09'27" | 10.0 | 04:06 | 08:52 | 13:37 |
| NGC3077 | Gal | UMa | 10h 03m 20s | +68°44'02" | 9.9 | Circum | 08:52 | Circum |
| NGC3115 | Gal | Sex | 10h 05m 14s | -07°43'08" | 9.2 | 03:12 | 08:54 | 14:35 |
| NGC3132 | P Neb | Vel | 10h 07m 02s | -40°26'11" | 8.0 | 05:12 | 08:55 | 12:39 |
| NGC3159 | Gal | LMi | 10h 13m 53s | +38°39'15" | 13.4 | 00:47 | 09:02 | 17:17 |
| NGC3201 | Glob | Vel | 10h 17m 37s | -46°24'45" | 6.8 | 06:01 | 09:06 | 12:11 |
| NGC3198 | Gal | UMa | 10h 19m 55s | +45°33'00" | 10.4 | 00:09 | 09:08 | 18:08 |
| NGC3242 | P Neb | Hya | 10h 24m 46s | -18°38'34" | 9.0 | 04:03 | 09:13 | 14:23 |

A.V.A.C. Information

Membership in the Antelope Valley Astronomy Club is open to any individual or family.

The Club has three categories of membership.

- Family membership at \$30.00 per year.
- Individual membership at \$25.00 per year.
- Junior membership at \$15.00 per year.

Membership entitles you to...

- Desert Sky Observer—monthly newsletter.
- The Reflector – the publication of the Astronomical League.
- The A.V.A.C. Membership Manual.
- To borrow club equipment, books, videos and other items.

AVAC
P.O. BOX 8545,
LANCASTER, CA 93539-8545

Visit the Antelope Valley Astronomy Club website at www.avastronomyclub.org/

The Antelope Valley Astronomy Club, Inc. is a 501(c)(3) Non-Profit Corporation.

The A.V.A.C. is a Sustaining Member of The Astronomical League and the International Dark-Sky Association.

Board Members

President:

Darrell Bennett
president@avastronomyclub.org

Vice-President:

Matt Leone (661) 713-1894
vice-president@avastronomyclub.org

Secretary:

Frank & Rose Moore (661) 972-1953
secretary@avastronomyclub.org

Treasurer:

Rod Girard (661) 803-7838
treasurer@avastronomyclub.org

Director of Community Development:

Robert Lynch, Jr.
community@avastronomyclub.org

Appointed Positions

Newsletter Editor:

Steve Trotta (661) 269-5428
dso@avastronomyclub.org

Equipment & Library:

Vacant
library@avastronomyclub.org

Club Historian:

Tom Koonce (661) 943-8200
history@avastronomyclub.org

Webmaster:

Steve Trotta (661) 269-5428
webmaster@avastronomyclub.org

Astronomical League Coordinator:

Frank Moore (661) 972-4775
al@avastronomyclub.org

Our Sponsors

Thank you to our sponsors for your generous support!

Cosmos Level Sponsors

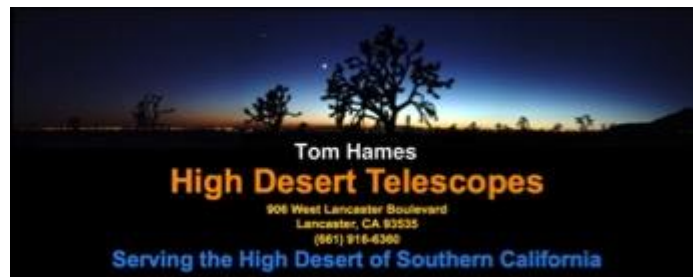


Woodland Hills Camera

5348 Topanga Canyon Blvd., Woodland Hills
888-427-8766.

www.telescopes.net

Universe Level Sponsors



Galaxy Level Sponsors



Al's Vacuum and Sewing

904 West Lancaster Blvd., Lancaster
(661) 948-1521